UPPER ADOBE CREEK
SANTA CLARA COUNTY, CALIFORNIA
IDENTIFICATION OF WATERS
OF THE UNITED STATES

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Prepared by

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Project No. 774-01

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EXECUTIVE SUMMARY

H. T. Harvey and Associates conducted field surveys along Reaches 1 through 16 (the study area) of upper Adobe Creek, for "Waters of the U.S." (hereafter referred to as "jurisdictional waters"), including areas meeting the technical criteria of jurisdictional wetlands. The objective of the survey was to delineate areas meeting the regulatory definition of jurisdictional waters, using USACE methods, and to have the delineation verified by USACE staff.

The ordinary high water (OHW) mark along the banks of Adobe Creek were determined using a combination of field characteristics and modeled data for the OHW (2.3-yr. flood event). The estimated elevation of the OHW mark, obtained by hydrologic modeling of the watershed of Adobe Creek, was used to delineate the OHW mark onto aerial-topographic maps of the study area. The elevation of the OHW mark within the study area was subsequently field-checked using physical characteristics, where possible. The location of the OHW mark obtained from hydrologic modeling was altered wherever clear field indicators of the OHW mark were observed. Surveys were also conducted for adjacent wetlands which may occur above the OHW mark and for wetlands which occur below the OHW mark. Anecdotal information regarding the Creek water levels during the last several years (to several decades) was gathered from personal interviews with individuals that work or live directly adjacent to Adobe Creek. This information helped to verify our findings.

Jurisdictional waters subject to provisions of Section 404 of the Clean Water Act were identified within the study area. These included wetlands situated below the OHW marks of the banks of Adobe Creek and tributary waters defined by the OHW marks on opposing Creek banks. Areas meeting the technical definition of wetlands were not observed above the OHW marks within the study area. The remainder of the study site, as defined by the project boundaries, did not meet the regulatory definitions of a jurisdictional water, under Section 404 of the Clean Water Act. The elevation of the ordinary high water (OHW) mark, obtained from hydrologic modeling, was generally in agreement with our estimate of the location of the mark based upon field characteristics such as scour marks, rack lines, sediment deposition and exposed roots. Along several stretches of the Creek, however, the location of the OHW marks obtained from field characteristics was substantially lower than that obtained from hydrologic modeling. This seasonal creek is not subject to the ebb and flow of the tide and should not be considered "navigable". Therefore, it does not appear to be regulated under provisions of Section 10 of the Rivers and Harbors Act.

INTRODUCTION

PROJECT AREA DESCRIPTION

The upper Adobe Creek study area is located within the city limits of Palo Alto, Los Altos and Los Altos Hills, Santa Clara County, California (Fig. 1). Portions of Adobe Creek addressed in this report (Reaches 1 through 16) extend from El Camino Real to Moody Road adjacent to Elephant Mountain (Fig. 2A and Sheet 2B). The study area is approximately 7.5 miles long. It occurs on the U.S. Geological Survey Quadrangle Maps Mountain View (Township 6, south; Range 2, west), Palo Alto (Township 6, south; Range 2, west), Cupertino (Township 6, south; Range 2, west) and Mindego Hill (Township 6, south and 7, south; Range 2, west and 3 west).

Adobe Creek flows from its headwaters along Monte Bello Ridge in the Santa Cruz Mountains to San Francisco Bay through Charleston Slough. The average annual rainfall for the vicinity of the project site is between 16 inches and 20 inches per year. However, the Santa Clara Valley, in general, received approximately 150% of normal rainfall during the winter of 1992-93; it was during this season that the present studies were conducted on site. The majority of this rainfall occurred between the months of October and April.

Daily high summer temperatures are usually between 80-degrees Fahrenheit (F) and 95-degrees F with several days in excess of 100-degrees F. Minimum winter temperatures may occasionally drop to 20-degrees F (Soil Conservation Service "SCS" 1968). Site elevations range from approximately 50 ft., national geodetic vertical datum (NGVD), along the Creek banks near El Camino Real, to approximately 540 ft. NGVD along the upper reaches of the Creek near Moody Rd.

The study area occurs on several different soil types. These soil phases include Azule silty clay loam, 9 to 15% slopes, eroded; Gilroy clay loam, 15 to 30% slopes, eroded; Garretson gravelly loam, 0 to 5% slopes; Pleasanton loam, 0 to 2% slopes; Pleasanton gravelly loam, 0 to 2% slopes; Pleasanton gravelly loam, 2 to 9% slopes; and, Zamora loam, 0 to 2% slopes (SCS 1968). None of these soils are classified as hydric (SCS 1992).

PROJECT DESCRIPTION

The Santa Clara Valley Water District proposes to implement elements of a flood control plan within the bed, bank and channel of Reaches 1 through 16 of Adobe Creek. These improvements are associated with flood control upgrade alternatives for Reaches 1 through 16. This work includes improvements and replacement of culverts, replacement of a bridge, improvements to gabion linings and by-pass entrances and maintenance to access easements.

REGULATIONS OVERVIEW/ DEFINITIONS

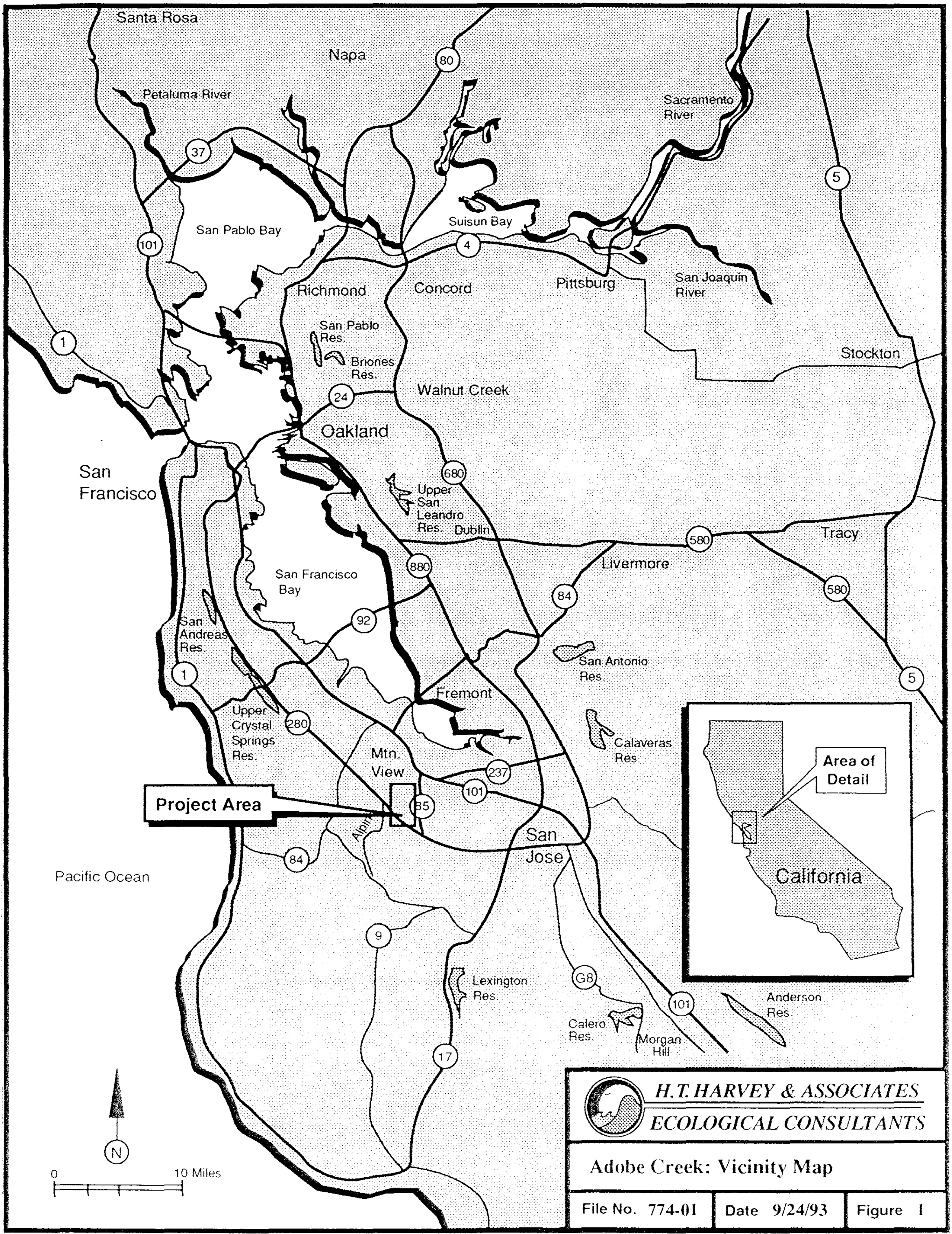
Field surveys were conducted along upper Adobe Creek for areas which meet the regulatory definition of jurisdictional waters. Such areas are subject to the regulatory jurisdiction of the U.S. Army Corps of Engineers (USACE). The USACE under provisions of Section 404 of the Clean Water Act (1972), has jurisdiction over "Waters of the United States" (jurisdictional waters). These jurisdictional waters may include all Waters used, or potentially used, for interstate commerce, including all Waters subject to the ebb and flow of the tide, all interstate Waters, all other Waters (intrastate lakes, rivers, streams, mudflats, sandflats, playa lakes, natural ponds, etc.), all impoundments of Waters otherwise defined as "Waters of the U. S.", tributaries of Waters otherwise defined as "Waters of the U. S.", the territorial seas, and wetlands adjacent to "Waters of the U.S." (33 CFR, Part 328, Section 328.3).

Areas not considered to be jurisdictional waters include non-tidal drainage and irrigation ditches excavated on dry land, artificially-irrigated areas, artificial lakes or ponds used for irrigation or stock watering, small artificial water bodies such as swimming pools, and water-filled depressions (33 CFR, Part 328).

Activities within the channel of Adobe Creek may be regulated by the U.S. Army Corps of Engineers (USACE) and California Department of Fish and Game (CDFG). The placement of fill into "Waters of the United States" (jurisdictional waters), such as Adobe Creek, must be in compliance with permit requirements of the USACE, under the Clean Water Act (1972). Similarly, activities which result in the diversion or obstruction of the natural flow of a stream, or which substantially change its bed, bank or channel, or which utilize any materials, including vegetation, from the streambed require that the project applicant enter into a Streambed Alteration Agreement with the CDFG, under Sections 1601-1603 of the Fish and Game Code of California (1992).

PURPOSE

H. T. Harvey and Associates surveyed the project site for areas which meet the regulatory definition of Waters of the United States (jurisdictional waters). Development in areas identified as Waters is subject to the permit requirements of the U.S. Army Corps of Engineers (USACE), under Section 10 of the Rivers and Harbors Act (1899) and Section 404 of the Clean Water Act (1972). The purpose of our studies was to identify jurisdictional waters, including wetlands, delineate their boundaries and prepare this technical report of findings.



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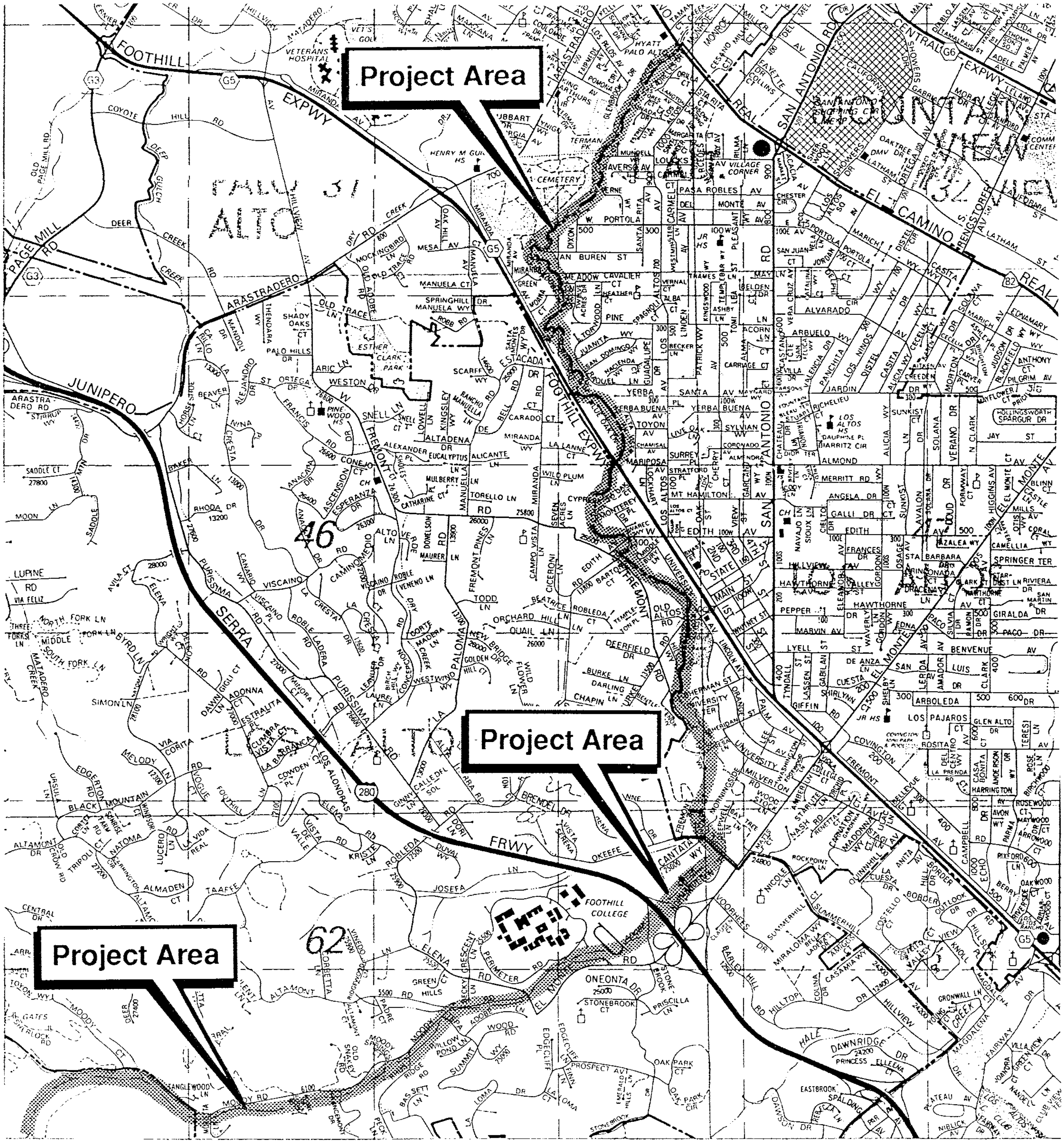
Adobe Creek: Vicinity Map

File No. 774-01 | Date 9/24/93 | Figure 1



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Adobe Creek: Site Map

File No. 774-01 Date 9/24/93 Figure 2A

SURVEY METHODS

GENERAL APPROACH

Reaches 1 through 16 of Adobe Creek were examined for jurisdictional waters in July, August and September 1993. Jurisdictional waters potentially occurring within the study area included wetlands (special aquatic sites) meeting certain criteria and "tributary waters". The studies described in this report were conducted to identify tributary waters which extend to the ordinary high water mark (OHW), to survey for adjacent wetlands which occur above the OHW mark (outside of delineated tributary waters) and to identify wetlands which occur below the OHW marks (within delineated tributary waters).

Sample transects were placed approximately every 200 ft., wherever possible, along the entire length of the study area (approx. 7.5 miles). The transects were situated perpendicular to the Creek channel. Two sample points were established at each transect. One sample point was located above the ordinary high water (OHW) mark (designated as sample point "B"). A separate sample point was established below the OHW mark (designated as sample point "A").

Additional sample points were located within areas meeting the technical criteria of jurisdictional wetlands (designated as sample point "W"). Information obtained at each of these sample points in regards to vegetation, soils and hydrology was compiled onto individual data sheets. This level of survey effort was deemed necessary in order to accurately document the location of areas meeting the regulatory definition of jurisdictional Waters within the study area. The intervals between the transects were also visually surveyed for areas meeting the technical criteria of jurisdictional wetlands. Pertinent data for such areas were gathered and used to delineate their boundaries. Expanded descriptions of survey methodologies are described below.

IDENTIFICATION OF TRIBUTARY WATERS

Tributary waters are under the regulatory jurisdiction of the USACE. In the absence of adjacent wetlands, this jurisdiction extends to the ordinary high water (OHW) mark on opposing channel banks. The OHW mark is typically indicated by physical characteristics such as a clear, natural line impressed on the bank, shelving, changes in character of soil, destruction of vegetation, exposed roots on the bank or presence of litter and debris.

The estimated elevation of the OHW mark (= 2.3-yr. flood event) was provided by the Santa Clara Valley Water District (SCVWD; Mr. Peter Sheydayi and Mr. Scott Wilson). These data were obtained by hydrologic modeling of the watershed of Adobe Creek. Elevational cross-sections of the Creek were determined during field surveys conducted by the SCVWD in 1989. This information was subsequently combined to delineate the OHW mark onto aerial-topographic maps of the study area. The elevation of the OHW mark, within the study area, was subsequently field-checked using physical characteristics, where possible. The location of the OHW mark obtained from hydrologic modeling was altered wherever clear field indicators of the OHW mark were observed.

Anecdotal information regarding the Creek water levels during the last several years (to several decades) was gathered during personal interviews conducted with individuals that work or live directly adjacent to Adobe Creek. This information was used to verify our findings.

Ordinary high water marks observed in the field were drawn directly onto blue-line aerial photographs which were superimposed with topographic lines. Maps for the study area were based upon aerial photographs taken in June 1988 and reproduced at a scale of 1":50'.

IDENTIFICATION OF JURISDICTIONAL WETLANDS (SPECIAL AQUATIC SITES)

Surveys were conducted within the project boundaries for areas which meet the technical criteria of jurisdictional wetlands. Survey efforts for wetlands were concentrated in areas situated below the OHW mark of the banks of Adobe Creek and above the OHW mark in areas directly adjacent to the Creek. The vegetation, soils, and hydrology of the site were examined following the guidelines outlined in the "Routine Determination Method" in the *Corps of Engineers Wetlands Delineation Manual* (Environmental Laboratory 1987).

The study area was examined for topographic features, drainages, and areas of significant recent disturbance by walking the entire project site. A determination was then made as to whether normal environmental conditions were present at the time of the field surveys. Data were used to document which portions of the site were wetlands.

Vegetation. Plants observed at each of the sample sites were identified to species using standard floras appropriate for central California, wherever necessary. Such floras included *A California Flora and Supplement* (Munz and Keck 1973), *A Flora of the Marshes of California* (Mason 1969), *Manual of the Grasses of the United States* (Hitchcock 1971), and *Weeds of California* (Robbins, et al. 1970). The wetland indicator status of each species was obtained from the 1987 Wetland Plant List, California (Reed 1988). The names of plants were generally not taken from *The Jepson Manual* (Hickman 1993) as these names are not totally consistent with scientific names used in the *1988 Wetland Plant List, California* (Reed 1988) and the *National List of Scientific Plant Names* (Smithsonian Inst. 1982). A list of species for each observation area was then compiled and an assessment of the dominant species made (Appendix C). It was then determined which of the observation areas supported wetland vegetation.

Wetland indicator species are so designated according to their frequency of occurrence in wetlands. For instance, a species with a presumed frequency of occurrence of 67% to 99% in wetlands is designated a facultative wetland indicator species. The wetland indicator groups and the frequency of occurrence of species within them in wetlands are as follows:

INDICATOR CATEGORY	**INDICATOR SYMBOL**	**DEFINITION**
OBLIGATE	OBL	greater than 99%
FACULTATIVE WETLAND	FACW	67% - 99%
FACULTATIVE	FAC	34% - 66%
FACULTATIVE UPLAND	FACU	1% - 33%
UPLAND	UPL	less than 1%

Obligate and facultative wetland indicator species are hydrophytes that occur "in areas where the frequency and duration of inundation or soil saturation produce permanently or periodically saturated soils of sufficient duration to exert a controlling influence on the plant species present" (Environmental Laboratory 1987). Facultative indicator species may be considered wetland indicator species when found growing in hydric soils that experience periodic saturation. A complete list of the vascular plants of the project site, and their current indicator status has been provided in Appendix A.

Soils. Where possible, the top 22 inches of the soil profile was examined for hydric characteristics. Such characteristics include the presence of organic soils (Histisols), histic epipedons, aquic or peraquic moisture regime, presence of soil on hydric soil list, mottling indicated by the presence of gleyed or bright spots of colors (in the former case, blue grays; in the latter case, orange red, or red brown) within the soil horizons observed. Mottling of soils usually indicates poor aeration and lack of good drainage. Munsell Soil Notations (Munsell Soil Color Charts, Kollmorgen Instr. Corp. 1990) were recorded for the soil matrix for each soil sample. The last digit of the Munsell Soil Notation refers to the chroma of the sample. This notation consists of numbers beginning with 0 for neutral grays and increasing at equal intervals to a maximum of about 20. Chroma values of the soil matrix which are one (1) or less, or of two (2) or less when mottling is present, are typical of soils which have developed under anaerobic conditions. All soil colors indicated in this report were taken under clear, sunny skies using moistened soil samples.

In sandy soils, such as alluvial deposits in the bottom of drainage channels, hydric soil indicators include high organic matter content in the surface horizon and streaking of subsurface horizons by organic matter.

The soil survey, *Soil Survey of Santa Clara County, California* (Soil Conservation Service 1968) was consulted in order to determine which soil types have been mapped on the project site. Descriptions of soil mapping units and the list of hydric soils in Santa Clara County are included in Appendix B.

Hydrology. Each of the sample sites was examined for positive field indicators of wetland hydrology. Such indicators might include visual observation of inundation and/or soil saturation, water marks, drift lines, water-borne sediment deposits, water-stained leaves, and drainage patterns.

SURVEY RESULTS

GENERAL OBSERVATIONS

Jurisdictional waters subject to provisions of Section 404 of the Clean Water Act were identified within the study area. These included wetlands situated below the OHW marks of the banks of Adobe Creek and tributary waters defined by the OHW marks on opposing Creek banks. Areas meeting the technical definition of wetlands were not observed above the OHW marks within the study area. The remainder of the study site, as defined by the project boundaries, did not meet the regulatory definition of a jurisdictional water, whether under Section 404 of the Clean Water Act, or Section 10 of the Rivers and Harbors Act.

Biotic habitats observed within the channel and along the banks of Adobe Creek included a mixture of coast live oak/California bay riparian forest, ruderal (disturbed) and freshwater emergent/aquatic vegetation. Representative dominant plant species within each plant community included coast live oak (*Quercus agrifolia*), California bay (*Umbellularia californica*), coast redwood (*Sequoia sempervirens*), arroyo willow (*Salix hindsiana*), red willow (*Salix laevigata*), blue gum (*Eucalyptus globulus*), Himalayan blackberry (*Rubus procerus*) and poison oak (*Toxicodendron diversilobum*).

Other plant species included English ivy (*Hedera helix*), periwinkle (*Vinca major*), California black walnut (*Juglans hindsii*), valley oak (*Quercus lobata*), blue elderberry (*Sambucus mexicana*), big leaf maple (*Acer macrophyllum*), box elder (*Acer negundo*), California buckeye (*Aesculus californicus*), California rose (*Rosa californica*), tree-of-heaven (*Ailanthus altissima*), ripgut grass (*Bromus diandrus*), wild oats (*Avena barbata*), Italian thistle (*Carduus pycnocephalus*), yellow star-thistle (*Centaurea solstitialis*), Italian ryegrass (*Lolium multiflorum*), wild radish (*Raphanus sativus*), soft chess (*Bromus mollis*), small-fruited bulrush (*Scirpus microcarpus*), broad-leaved cattails (*Typha latifolia*), watercress (*Rorripa nasturtium-aquaticum*), veronica (*Veronica catenata*), tall umbrella sedge (*Cyperus eragrostis*) and rabbitfoot grass (*Polypogon monspeliensis*). Descriptions of biotic habitats of the study area have been described in a previous report (Habitat Restoration Group 1989).

Data forms (DATA FORM: ROUTINE ON-SITE DETERMINATION METHOD, USACE) for each of the sample points are presented in Appendix C. Site-specific information in regard to vegetation, soils and hydrology were entered onto the data forms primarily to document the presence of a jurisdictional wetlands situated below the OHW mark. The

USACE data forms are generally only used to aid in the delineation of jurisdictional wetlands. All sections (vegetation, soils and hydrology) of the forms were completed where jurisdictional wetlands were encountered.

In addition, vegetation, soils and hydrology information was also completed on the data forms at a representative number of sample points located throughout the project area at each of the transects. These forms were completed to document the presence or absence of jurisdictional wetlands situated above the OHW mark.

These forms, however, are useful to collect information in non-wetland sample sites. It was for this purpose that the majority of data forms were completed within the current study area. Due to the size of the project area (7.5 miles), the relatively intense level of sampling employed and the repetitive nature of information it was not considered necessary to fill out the soils and hydrology section of all data forms in these non-wetland areas. All sections of the forms, however, were completed where jurisdictional wetlands were encountered.

AREAS MEETING THE REGULATORY DEFINITION OF JURISDICTIONAL WATERS

Identification of Tributary Waters

The elevation of the ordinary high water (OHW) mark, obtained from hydrologic modeling, generally agreed with our estimate of the location of the mark based upon field characteristics such as scour marks, rack lines, sediment deposition and exposed roots. The location of the OHW marks along the banks of Adobe Creek within the study area are presented in Sheets 3 through 31 (oversize). Sheet 2B (oversize) shows the location of each individual Sheet (3 through 31) within the project boundaries. Dense vegetation, poured-concrete and sacked-concrete banks along much of Adobe Creek obscured physical characteristics of the OHW mark in many areas.

Along several stretches of the Creek the OHW marks obtained from field characteristics were substantially lower than that obtained from hydrologic modeling (e.g. Sheets 13 and 14). As a result, the distance of the OHW mark from the center of the Creek, using data generated from modeling, was substantially reduced in many locations. In some instances, the lateral distance of the OHW mark from the center of the Creek was reduced by as much as 100 ft. to 150 ft. Anecdotal information gathered at numerous locations along the study area verified these findings (see Persons Contacted in Literature Cited section of this report).

Areas below the OHW mark were primarily devoid of rooted vegetation. In many areas, the soils were often bare, although an extremely sparse cover of herbaceous or young woody vegetation including Himalaya berry (FAC), periwinkle (UPL), English ivy (UPL) and brown dogwood (FACW) were occasionally present. In some locations, the lower banks were obscured by dense, overhanging thickets of these species which were rooted on the banks above. In areas with open canopies, a moderately dense cover of herbaceous vegetation dominated including slender wild oats (UPL), ripgut brome (UPL), black mustard (*Brasssica nigra*; UPL) and wild radish (UPL). Gravel and sand bars within the channel were generally barren or were sparsely vegetated with upland species such as smilo grass (*Oryzopsis miliacea*; UPL), wild radish (UPL) and black mustard (UPL). Hydrophytic species including tall umbrella sedge (FACW), arroyo willow (FACW) and watercress (OBL) were occasionally observed as individual plants or relatively sparse clusters along the toe of slope. Many areas were devoid of vegetation due to the presence of gabion walls and retaining walls on the banks.

Hydric soil characteristics included soil chromas of 7.5 YR 3/2. Chromas of 10 YR 3/4, 10 YR 3/2, 5 YR 4/4 and 2.5 Y 4/2 were less common. Mottling and oxidized root channels were observed at 3 of the 22 sites sampled (5 YR 5/8, 2.5 YR 4/8). Areas with mottled soils were either devoid of vegetation or dominated by upland species. Soils occurring below the OHW marks were presumed to be exposed to an aquic moisture regime.

Surface or subsurface soil moisture (within sample pits) was not apparent within the bed of the Creek channel for most of its length within the study area. However, standing water and/or slowly-moving water was observed in numerous locations in the upper reaches of the Creek. At the time of the survey most of these areas were unvegetated. All areas below the OHW marks were presumed to be inundated for more than 7 consecutive days during the growing season.

Identification of Jurisdictional Wetlands (Special Aquatic Sites)

Areas meeting the technical criteria of jurisdictional wetlands within the study area are shown on Sheets 3 through 31 (oversize). Table 1 presents the sample location number and data form number of jurisdictional wetlands located below the OHW marks of upper Adobe Creek. The size of each of the jurisdictional wetlands within the study area is not reported in this report. These areas are relatively small in size and are somewhat ephemeral in nature. Many wetlands appear to be associated directly upstream or downstream of culverts, bridge overcrossings and other structures. Hydrophytic vegetation existing in a particular area identified as a jurisdictional wetlands one year may be removed, displaced or altered in size by the scouring action of water runoff within the banks of Abode Creek during the rainy season. A particular wetland, therefore, may not appear in the same location in two consecutive years. The approximate size and location of these areas, however, may be determined from Sheets 3 through 31.

Hydrophytic vegetation included watercress (OBL), small-fruited bulrush (OBL) and arroyo willow (FACW). Watercress (OBL) was the dominant species of the majority of the wetlands and was occasionally the only species present. Pink water speedwell (*Veronica catenata*; OBL) and tall umbrella sedge (FACW) were common co-dominants. Less abundant species included rabbitfoot grass (FAC), prickly lettuce (*Lactuca serriola*; FAC), curly dock (*Rumex crispus*; FACW-), sneezeweed (*Helenium puberulum*; FACW), annual bluegrass (*Poa annua*; FACW-), Himalaya berry (FAC), arroyo willow (FACW), bristly ox tongue (*Picris echioides*, FAC) and scarlet monkey flower (*Mimulus cardinalis*; OBL). Several wetland areas, particularly in the vicinity of Foothill College, were dominated by small-fruited bulrush (OBL). Broad-leaved cattails (OBL) and small-fruited bulrushes (OBL) formed monotypic stands in many areas. Arroyo willows (FACW) in association with Himalaya berry (FAC) and brown dogwood (FACW) were occasionally observed within the Creek banks.

Hydric soil characteristics included soils of low chroma (7.5 YR 3/2) with mottling and oxidized root channels (5 YR 5/8). Soils were generally composed of alluvial sediments ranging in texture from fine sandy clay to gravel and stones. Soils occurring below the OHW marks were presumed to be exposed to an aquic moisture regime.

All areas meeting the technical definition of jurisdictional wetlands were located below the OHW marks within the Creek channel. Most wetland areas were not inundated at the time of the survey (July - September 1993). All areas below OHW marks were presumed to be inundated for more than consecutive 7 days during the growing season.

AREAS NOT MEETING THE REGULATORY DEFINITION OF JURISDICTIONAL WATERS

Areas situated above the OHW marks were dominated by a mixture of facultative and upland species including Himalaya berry (FAC), periwinkle (UPL), English ivy (UPL), poison oak (UPL), brown dogwood (FACW), California blackberry (UPL), California rose (FAC+) and snowberry (*Symphoricarpos rivularis*; FACU). Vegetation within the understory varied from relatively sparse to impenetrable. Overstory vegetation along the Creek was generally rooted on the upper portions of the banks where slope angles were gentle enough to permit growth and along the bank tops. These species included California bay (FAC), holly-leaved cherry (*Prunus ilicifolia*; UPL), arroyo willow (FACW), California buckeye (UPL) and live oak (UPL).

Hydric soil characteristics were generally absent. Soil chromas were typically 7.5 YR 3/2; mottling and oxidized root channels were not observed.

Sample sites situated above the OHW marks were generally devoid of hydrologic characteristics. Scouring, exposure of bare roots and litter deposited in shrubs and trees were occasionally observed above the OHW mark along the channel banks. Areas of high-bank scouring were often associated near channels bends, or located just downstream of riprap banks. This scouring was presumed to be caused by higher than average stream flows of the previous rainfall season.

Table 1. Sample location number and sheet number of areas meeting the technical criteria of jurisdictional wetlands below the ordinary high water mark of upper Adobe Creek.

Sample Location Number*	Sheet Number
W26A	7
W40A	9
W41A	"
W42A	"
W45A	10
W45B	"
W46A	"
W47A	"
W48A	"
W49A	10A
W49B	"
W49C	"
W49D	"
W50A	"
W50B	"
W50C	"
W50D	"
W51A	"
W52A	"
W54A	11
W59A	12
W62A	"
W62B	"
W62C	"
W63A	"
W63B	"
W63C	"
W63D	"
W64A	"
W64B	"
W64C	"
W65A	"
W65B	"
W67A	13
W67B	"

Sample Location Number	Sheet Number
W75A	14
W83A	15
W85A	"
W85B	"
W99A	17
W100A	"
W110A	21
W111A	"
W114A	"
W115A	22
W116A	"
W116B	"
W116C	"
W117A	"
W117B	"
W117C	"
W117D	"
W117E	"
W118A	"
W118B	"
W118C	"
W118D	"
W118E	"
W119A	23
W119B	"
W124A	25
W124B	"
W124C	"
W125A	"
W126A	"
W126B	"
W131A	26
W131B	"
W133A	"
W134A	27

*, denotes areas meeting the technical criteria of jurisdictional wetlands.

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PERSONS CONTACTED

Bell, Bruce. WSC Development property. Creek has only jumped its banks three times in the past 30 years.

Copock, Gerald and Mary. 25461 Fremont Rd. Have lived adjacent to Adobe Creek since 1955. In 38 years Adobe Creek has only flooded the street near their house three times.

Ledterman, Ms. Has lived next to Adobe Creek for over 30 years. Creek has overflowed its banks near her house 4 times.

McCarthy, Brian J. Public Works Supervisor, City of Los Altos. (415) 948-0482. In normal rainfall years Adobe Creek is totally confined to its banks.

Sheydayi, Peter A. Assistant civil engineer. Santa Clara Valley Water District. (408) 268-7687.

Wilson, Scott M. Associate civil engineer. Santa Clara Valley Water District. (408) 927-0710.

APPENDIX A
VASCULAR PLANTS OF THE UPPER ADOBE CREEK PROJECT

Appendix A. Vascular plants observed on the Adobe Creek project site.

FAMILY NAME	SCIENTIFIC NAME	COMMON NAME	INDICATOR STATUS
ACERACEAE	*Acer macrophyllum*	big leaf maple	FAC
	Acer negundo	box elder	FACW
ANACARDIACEAE	*Schinus molle*	Peruvian pepper tree	UPL
	Toxicodendron diversilobum	poison oak	UPL
APIACEAE	*Coninum maculatum*	poison hemlock	FACW
	Foeniculum vulgare	fennel	FACU
APOCYNACEAE	*Vinca major*	periwinkle	UPL
ARALIACEAE	*Hedera helix*	English ivy	UPL
ASTERACEAE	*Anthemis cotula*	mayweed	FACU
	Artemisia douglasiana	mugwort	FACW
	Baccharis pilularis	coyote brush	UPL
	Baccharis viminea	mule fat	FACW
	Carduus pycnocephalus	Italian thistle	UPL
	Centaurea solstitialis	yellow star thistle	UPL
	Cirsium vulgare	bull thistle	FACU
	Helenium puberulum	sneezeweed	FACW
	Hypochaeris glabra	smooth cat's ear	UPL
	Lactuca serriola	prickly lettuce	FAC
	Senecio vulgaris	common groundsel	NI
	Sonchus oleraceus	common sow thistle	UPL
	Xanthium strumarium	cocklebur	FAC+
	Picris echioides	bristly ox tongue	FAC
BETULACEAE	*Alnus rhombifolia*	white alder	FACW
BRASSICACEAE	*Brassica nigra*	black mustard	UPL
	Raphanus sativa	wild radish	UPL
	Rorippa nasturtium–aquaticum	true watercress	OBL
CAPRIFOLIACEAE	*Lonicera hispidula*	hairy honeysuckle	UPL
	Lonicera involucrata	twinberry	FAC
	Symphoricarpus rivularis	common snowberry	FACU
	Sambucus mexicana	blue elderberry	FAC
CARYOPHYLLACEAE	*Stellaria media*	common chickweed	FACU
CHENOPODIACEAE	*Chenopodium sp.*	goosefoot	–
CORNACEAE	*Cornus californica*	western red dogwood	FACW (?)
	Cornus glabrata	brown dogwood	FACW
CUCURBITACEAE	*Marah fabaceous*	wild cucumber	UPL
CYPERACEAE	*Cyperus eragrostis*	tall umbrella sedge	FACW
	Carex sp.	sedge	–
	Scirpus microcarpus	small–fruited bulrush	OBL
DRYOPTERIDACEAE	*Athyrium felix–femina*	lady fern	FAC
ERICACEAE	*Arbutus menziesii*	madrone	UPL
FABACEAE	*Acacia sp.*	acacia	UPL
	Robinia psuedo–acacia	black locust	FAC

Appendix A continued.

FAMILY NAME	SCIENTIFIC NAME	COMMON NAME	INDICATOR STATUS
FABACEAE	*Medicago polymorpha*	California burclover	UPL
	Melilotus albus	white sweetclover	FACU+
FAGACEAE	*Quercus agrifolia*	coast live oak	UPL
	Quercus kellogii	black oak	UPL
	Quercus lobata	valley oak	FAC
GARRYACEAE	*Garrya elliptica*	silt tassel bush	UPL
HIPPOCASTANACEAE	*Aesculus californicus*	California buckeye	UPL
JUGLANDACEAE	*Juglans hindsii*	California black walnut	FAC
JUNCACEAE	*Juncus xiphioides*	iris–leaved rush	OBL
LAMIACEAE	*Marrubium vulgare*	white horehound	FAC
	Mellisa officinales	lemon balm	UPL
LAURACEAE	*Umbellularia californica*	California bay	FAC
LILIACEAE	*Smilacina sp.*	false solomon's seal	FAC
MALVACEAE	*Malva sp.*	mallow	UPL
MORACEAE	*Ficus carica*	edible fig	UPL
MYRTACEAE	*Eucalyptus globulus*	blue gum	UPL
OLEACEAE	*Fraxinus latifolia*	Oregon ash	FACW
	Ligustrum sp.	privet	UPL
ONAGRACEAE	*Epilobium adenocaulon*	willow herb	UPL
PAPAVARACEAE	*Eschscholzia californica*	California poppy	UPL
POACEAE	*Avena barbata*	slender wild oats	UPL
	Arundo donax	arundo grass	FACW
	Bromus carinatus	California brome	UPL
	Bromus diandrus	ripgut brome	UPL
	Bromus mollis	soft chess	FACU–
	Bromus rubens	foxtail chess	UPL
	Hordeum leporinum	Farmer's foxtail	UPL
	Lolium multiflorum	Italian ryegrass	FAC
	Oryzopsis miliacea	smilo grass	UPL
	Paspalum dilatatum	dallis grass	FAC
	Phalaris tuberosa	Harding grass	FACU
	Poa annua	annual bluegrass	FACW–
	Polypogon monspeliensis	rabbitfoot grass	FACW+
	Avena fatua	wild oats	UPL
POLYGONACEAE	*Polygonum aviculare*	prostrate knotweed	FAC
	Polygonum lapathifolium	willow weed	OBL
	Rumex crispus	curly dock	FACW–
POTOMOGETOMACEAE	*Potamogeton sp.*	pondweed	–
RANUNCULACEAE	*Clematis ligusticifolias*	virgin's bower	FAC
RHAMNACEAE	*Rhamnus californicus*	coffeberry	UPL
	Rhamnus crocea	redberry	OBL
ROSACEAE	*Cotoneaster sp.*	cotoneaster	UPL
	Heteromeles arbutifolia	toyon	UPL
	Holodiscus discolor	ocean spray	UPL
	Prunus ilicifolia	holly–leaved cherry	UPL
	Rosa californica	California rose	FAC+
	Rubus parviflorus	thimbleberry	FAC+
	Rubus procerus	Himalaya blackberry	FAC

Appendix A continued.

FAMILY NAME	SCIENTIFIC NAME	COMMON NAME	INDICATOR STATUS
	Rubus ursinus	California blackberry	UPL
SALICACEAE	*Populus fremontii*	Fremont cottonwood	FACW
	Salix hindsiana	arroyo willow	FACW
	Salix laevigata	red willow	UPL
	Salix lasiolepis	arroyo willow	FACW
SALVINIACEAE	*Azolla filiculoides*	American water fern	OBL
SAXIFRAGACEAE	*Ribes sp.*	gooseberry	–
SCROPHULARIACEAE	*Mimulus cardinalis*	scarlet monkey flower	OBL
	Scrophularia californica	California figwort	FAC
	Veronica catenata	pink water speedweed	OBL
SIMAROUBACEAE	*Ailanthus altissima*	tree of heaven	FACU
SOLANACEAE	*Solanum nigrum*	black nightshade	FACU
ULMACEAE	*Ulmus sp.*	elm	UPL
URTICACEAE	*Urtica dioica ssp. holosericea*	stinging nettle	FACW
TAXODIACEAE	*Sequoia sempervirens*	coast redwood	UPL
TYPHACEAE	*Typha latifolia*	broad–leaved cattail	OBL
ZYGOPHYLLACEAE	*Tribulus terrestris*	puncture vine	UPL

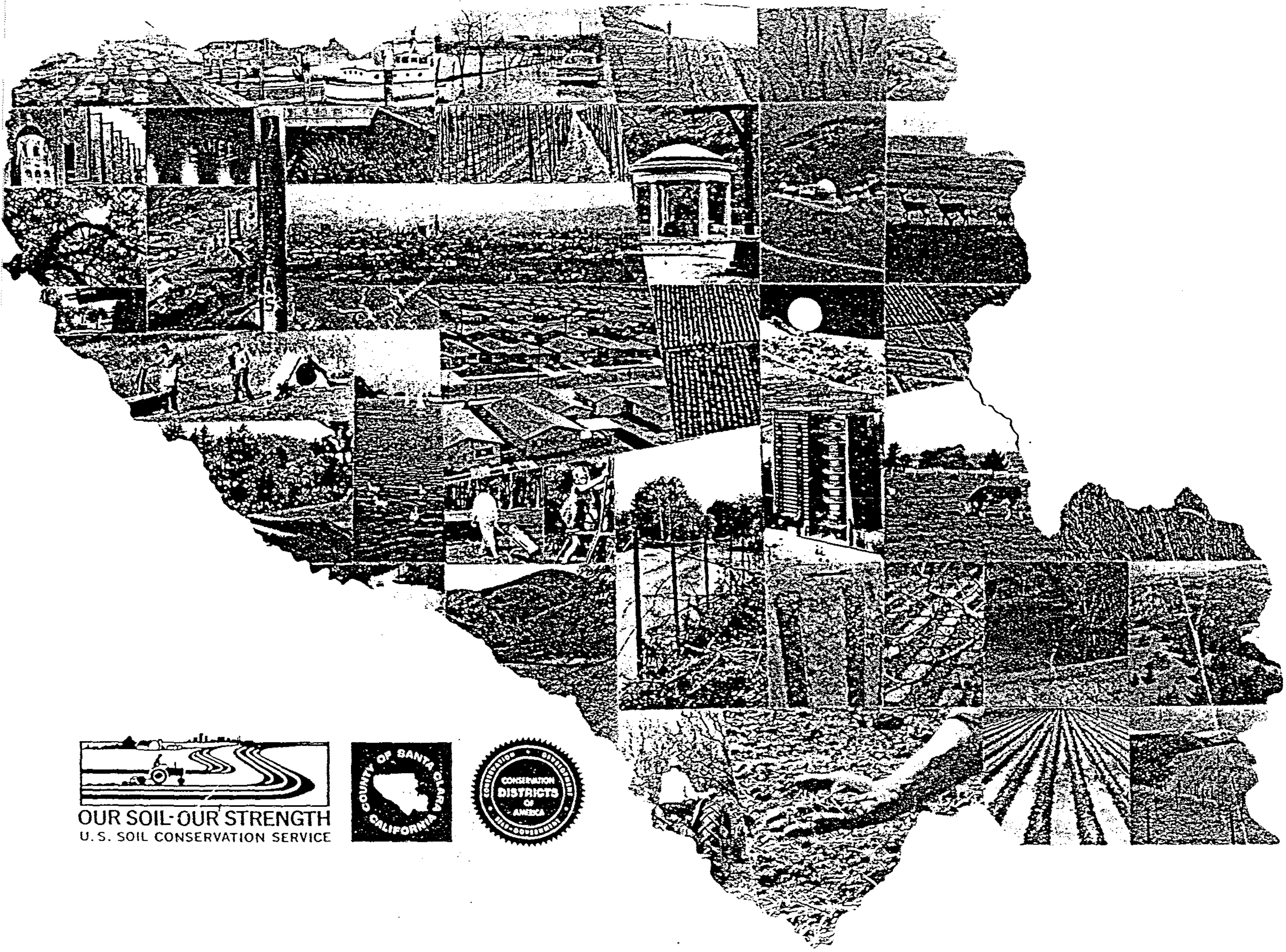
The species list is arranged alphabetically by family name for all vascular plants encountered during a plant survey. Plants are also listed alphabetically within each family. In some cases it was not possible to accurately identify a particular plant to the species level due to the absence of specific anatomic

The wetland status o feach species is based upon U.S. Fish and Wildlife Service wetland plant designations, and is designated as follows:

OBL – Obligate
FACW – Facultative wetland
FAC – Facultative
FACU – Facultative upland
NR – No review
NA – No agreement
NI – No investigation

APPENDIX B
SOILS OF THE UPPER ADOBE CREEK PROJECT

SOILS OF SANTA CLARA COUNTY



OUR SOIL-OUR STRENGTH
U.S. SOIL CONSERVATION SERVICE

COUNTY OF SANTA CLARA CALIFORNIA

CONSERVATION DISTRICTS OF AMERICA

Prepared by the United States Department of Agriculture, Soil Conservatio Service, in cooperation with and for the County of Santa Clara Plannin Department, the Santa Clara County Flood Control and Water District, and th Black Mountain, Evergreen, and Loma Prieta Soil Conservation Districts is similar to Ayar clay, 15 to 30 percent slopes. Included in mapping are areas of Climara clay 15 percent; areas of dark gray, calcareous clay soils and areas of moderate to severe sheet erosion.

This soil is planted to dryland apricots and prune orchards or used for dryland hay and pasture. Erosion is a problem to control when this soil is cultivated. Capability unit IIIe5 (15); pasture and range site Clayey.

Ayar clay, 30 to 50 percent slopes (AsF). This soil occurs as steep areas with slopes of about 40 percent average, associated with moderately steep areas of other Ayar soils. Erosion hazard is high and surface runoff is rapid. Otherwise, this soil is similar to Ayar clay 15 to 30 percent slopes. Included in mapping this soil are areas of San Benito clay loam 10 percent; areas of rock outcrops, and areas of moderate to severe sheet erosion.

This soil is used for dryland pasture and range. Because of the erosion hazard, proper range management is important. Capability unit VIe5 (15); pasture and range site Clayey, steep phase.

AZULE SERIES

The Azule series consists of well drained soils, having fine textured subsoils, underlain by stratified semiconsolidated soft sediments, at depths of 3 to 5 feet. They formed on strongly sloping to very steep uplands. Vegetation is chiefly annual grasses and forbs; a few areas have an oak tree or brush cover. Elevations range from 500 to 2,000 feet. Mean annual rainfall is 16 to 25 inches; mean annual air temperature is 58 to 60° F. The growing season is about 200 to 250 days. Altamont,Montara and Hillgate are the principal associated soils.

The surface soil averages from 6 to 14 inches in thickness and is dark grayish brown clay loam or silty clay loam. The subsoil is a brown, gravelly sandy clay, ranging in thickness from 24 to 44 inches. The substratum is gravelly clayey, soft sediments.

Azule soils are used for dryland orchards, vineyards, grain hay, pasture, range, wildlife and watershed.

Azule clay loam, 30 to 75 percent slopes (AuG). This soil occurs as broad steep to very steep areas on the hills along the eastern edge of the Santa Clara Valley. Slopes range from 50 to 60 percent.

Representative profile: 200 yards up, on hillside east of New Avenue, one mile east of Foothill Avenue intersection in the N. E. 1/4 of the S. E. 1/4 of Sec. 6, T. 10 S., R. 4 E., Santa Clara County, California.

A1 0 to 12 inches, dark grayish brown (10YR 4/2) clay loam, very dark grayish brown (10YR 3/2) moist; massive;

breaking to a weak fine granular structure; hard, friable, sticky and plastic; plentiful very fine roots; many very fine interstitial, fine tubular and a few medium tubular pores; medium acid (pH 6.0); clear wavy boundary (6 to 14 inches thick).

B2t 12 to 28 inches, brown (7.5YR 5/4) gravelly sandy clay, dark brown (7.5YR 4/4) moist; weak coarse columnar breaking to moderate coarse and medium subangular blocky structure; very hard, firm, sticky and plastic; few very fine roots; many very fine interstitial and plentiful fine tubular pores; continuous thin and common moderately thick clay films on ped faces and in pores; medium acid (pH 6.0); clear smooth boundary. (12 to 20 inches thick).

B3t 28 to 48 inches, yellowish brown (10YR 5/4) gravelly sandy clay, dark yellowish brown (10YR 4/4) moist; variegated with brown (7/5YR 5/4) dry and dark brown (7.5YR 4/4) moist; moderate medium subangular blocky structure; hard, friable, sticky and plastic; many very fine interstitial and common very fine tubular pores; continuous thin clay films on peds and in pores; medium acid (pH 6.0); gradual smooth boundary. (12 to 24 inches thick).

C 48 to 60 inches, light yellowish brown (10YR 6/4) gravelly sandy clay loam, yellowish brown (10YR 5/4) moist; massive; hard, very friable, slightly sticky and slightly plastic; many very fine interstitial pores; common thin colloid stains on mineral grains brown (7.5YR 5/4) and dark brown (7.5YR 4/4) medium acid (pH 6.0).

Surface soil color may be dark grayish brown, grayish brown or dark gray. Reaction is neutral to medium acid. Texture is a clay loam but a few places are silty loam or silty clay. Subsoil colors are brown to yellowish brown or grayish brown. Reaction is medium acid to neutral; there are areas where the lower subsoil is moderately alkaline. Texture is typically gravelly sandy clay but will range from gravelly clay to heavy clay loam. Depth to the substratum layer will range from 24 to 58 inches, but will average 48 inches. Very few roots reach this material, but it is not impervious. In a few places, seams of lime will occur.

Included in mapping this soil are areas of Altamont clay 10 percent; along ridge crests and toe slopes, 10 percent Hillgate silt loam and small landslips, and areas of gullied land.

This well drained soil holds about 4 to 8 inches of water plants can use. Natural fertility is high. Subsoil permeability is slow. Surface runoff is rapid to very rapid and erosion hazard is high to very high. Favorable rooting depth is moderate to deep.

This soil is used for range, wildlife and watershed. Protection against reducing density of cover is necessary to prevent accelerated erosion of this soil. Capability unit VIIe5 (15); pasture and range site Fine Loamy, very steep phase.

Azule clay loam, 30 to 75 percent slopes, eroded (AuG2). This soil occurs as broad steep to very steep areas on the hills along the eastern edge of the Santa Clara Valley. The average slopes range from 50 to 60 percent. Past sheet erosion has removed 2 to 4 inches of the surface soil. Average water holding capacity is 4 to 6 inches. Color is dominantly grayish brown, and a few places appear a shade lighter toward brown or pale brown. Otherwise, this soil is similar to Azule clay loam 30 to 75 percent slopes. Included in mapping this soil are areas of severe sheet and rill erosion, landslips and Gullied land, 10 percent; and 5 percent Hillgate silt loam.

This soil is used for range, wildlife and watershed. Capability unit VIIe5 (15); pasture and range site Fine Loamy, very steep phase.

Azule silty clay loam, 9 to 15 percent slopes, eroded (AvD2). This soil occurs as strongly sloping ridgetops and toe slope areas or as sloping benches, geographically associated with Hillgate soils. Average slope is about 12 percent. Texture is typically silty clay loam, but ranges from clay loam to silty clay. Past sheet erosion is moderate and sheet erosion has removed about 2 to 6 inches of the surface soil. Surface runoff is medium and erosion hazard is moderate. Average water holding capacity is 4 to 6 inches. Otherwise, this soil is similar to Azule clay loam, 30 to 75 percent slopes. Included in mapping are areas of Hillgate silt loam 15 percent; small areas of gravelly texture and areas of severe sheet and rill erosion.

This soil is used for growing dryland prunes, grapes, grain hay and pasture. Capability unit IIIe5 (15); pasture and range site Fine Loamy.

Azule silty clay loam, 15 to 30 percent slopes (AvE). This soil occurs on broad rounded ridgetops and as areas of moderately steep rounded hills. Average slope is 25 percent. Texture is typically silty clay loam but ranges from clay loam to silty clay. Surface runoff is medium and the erosion hazard is moderate. Otherwise, this soil is similar to Azule clay loam, 30 to 75 percent slopes. Included in mapping this soil are 15 percent Hillgate silt loam and a few deeply cut gullies.

This soil is used for dryland pasture and range. Capability unit IVe5 (15); pasture and range site Fine Loamy.

Azule silty clay loam, 15 to 30 percent slopes, eroded (AvE2). This soil occurs on moderately steep ridgetops and toe slopes, with slopes averaging about 25 percent. Texture is typically a silty clay loam but ranges from clay loam to silty clay.

Most of this soil is moderately eroded having lost about 2 to 6 inches of surface soil. This soil holds about 4 to 6 inches of water plants can use. Surface runoff is medium; erosion hazard is moderate. Otherwise, it is similar to Azule clay loam 30 to 75 percent slopes.Included in mapping this soil are 15 percent Hillgate silt loam; areas of gravelly texture; areas of severe sheet and rill erosion, and areas of Gullied land.

This soil is used for growing dryland prunes, grapes, grain hay and pasture. Capability unit IVe5 (15); pasture and range site Fine Loamy.

BAYSHORE SERIES

The Bayshore series consists of poorly drained, moderately fine textured soils, underlain by gleyed sedimentary alluvium. They are formed on low level positions of the alluvial plains. Vegetation is water-loving plants, annual grasses, and forbs. Elevations range from 30 to 100 feet. Mean annual rainfall is 16 to 20 inches; mean annual air temperature ranges from 58 to 60° F. The growing season is 250 to 300 days. Sunnyvale and Castro are the principal associated soils.

The surface soil averages 11 to 16 inches in thickness and is dark gray calcareous clay loam. The subsoil is a light gray and white, strongly calcareous clay loam, ranging in thickness from 21 to 37 inches. The substratum is light gray gravelly loams.

Bayshore soils are used for irrigated row crops, fruit orchards and pasture. Large areas are also used for commercial and housing developments.

Bayshore clay loam (Ba). This nearly level soil occurs in low positions of the alluvial plains.

Representative profile: 200 feet west of Lawrence Station Road, 50 feet north of drainage channel, across from Jefferson Union School; in the S. W. 1/4 of N. E. 1/4, Sec. 32, T. 6 S., R. 1 W; Santa Clara County, California.

Ap 0 to 8 inches, dark gray (N 4/) clay loam, black (10YR 2/1) moist; moderate fine granular structure; slightly hard, very friable, sticky and plastic; few very fine roots; common very fine interstitial pores; moderately alkaline (pH 8.0); violently effervescent with disseminated lime; clear smooth boundary. (6 to 9 inches thick).

A12 8 to 16 inches, dark gray (N 4/) light clay loam, black (10YR 2/1) moist; weak medium subangular blocky structure; slightly hard, very friable, sticky and plastic; few very fine roots; many very fine interstitial, common very fine and medium tubular pores; moderately alkaline (pH 8.0); violently effervescent with disseminated lime; clear

GARRETSON SERIES

The Garretson series consists of well drained, medium textured soils, underlain by sedimentary alluvium. These soils formed on nearly level to gently sloping first bottom positions along the larger drainageways. Vegetation is annual grasses and forbs, with a few scattered oak trees. Elevations range from 200 to 2,000 feet. Mean annual rainfall is 16 to 25 inches; mean annual air temperature is 58 to 60° F. The growing season is about 250 to 300 days. Esparto, Yolo and Zamora are the principal associated soils.

The surface soil ranges in thickness from 16 to 28 inches, and is a grayish brown neutral loam, gravelly loam or fine sandy loam. The subsoil is a brown, neutral, very fine sandy loam or loam, averaging 20 to 32 inches in thickness. The substratum is stratified, ranging from gravelly loam to sand and gravel.

Garretson soils are used for irrigated orchards, dryland grain hay and pasture.

Garretson loam, gravel substratum, 0 to 2 percent slopes (GaA). This soil occurs on first bottom positions, along the larger drainageways. The slopes usually average less than 2 percent.

Representative profile: In a walnut orchard, 6/10 of a mile south of Coyote and 50 feet north off farm road and 2/10 of a mile east off highway 101; Santa Clara County, California.

Ap 0 to 6 inches, grayish brown (10YR 5/2) loam, about 3 to 5 percent gravel, very dark grayish brown (10YR 3/2) when moist; massive; hard, friable, nonsticky and nonplastic; neutral (pH 7.0); clear smooth boundary. (4 to 10 inches thick).

A11 6 to 19 inches, grayish brown (10YR 5/2) loam, about 2 to 3 percent medium and fine gravel, very dark grayish brown (10YR 3/2) moist; massive; hard, friable, nonsticky and nonplastic; many very fine, few medium tubular pores; neutral (pH 7.0); clear smooth boundary. (12 to 18 inches thick).

C1 19 to 40 inches, brown (10YR 5/3) very fine sandy loam, dark brown (10YR 4/3) moist; massive; hard, friable, nonsticky and nonplastic; neutral (pH 7.0); clear smooth boundary. (20 to 32 inches thick).

IIC2 40 to 60 inches, stratified sands and gravels.

Surface soil colors may be brown or grayish brown. Reaction in the surface and subsoil may be slightly acid, neutral or moderately alkaline. Structure is massive and the texture is typically a loam but may be clay loam. Subsoil colors are brown,pale brown or yellowish brown. Texture may be very fine sandy loam, or gravelly loam. Clay content of the subsoil will average between 18 and 35 percent. The substratum at depths of 36 to 60 inches is stratified sand and gravel. A few areas may be calcareous below 36 inches.

Included in mapping this soil are areas of Cortina very gravelly loam 15 percent, and a few areas of sand and gravel substratum within 20 inches of the surface.

This well drained soil holds about 5 to 7 inches of water for plant use. Subsoil permeability is moderate and runoff is very slow. Erosion hazard is not a problem. Fertility is moderate. Depth of rooting zone is deep but may be somewhat restricted by the sand and gravel substratum.

This soil is used for irrigated prunes, walnuts and dryland hay and pasture. Capability unit IIs4 (14) and IIIcl (15).

Garretson gravelly loam, 0 to 5 percent slopes (GbB). This soil occurs on nearly level to gentle slopes, averaging 2 to 4 percent. The texture is a gravelly loam or gravelly clay loam. Subsoil and substratum is usually stratified but the same texture as the surface; the sand or gravel strata is missing. Subsoil permeability is moderately rapid and the soil holds 7 to 8 inches of water plants can use. Favorable rooting depth is very deep; runoff is slow; erosion hazard is slight. Otherwise, this soil is similar to Garretson loam, gravel substratum, 0 to 2 percent slopes. Included in mapping are slopes that range up to 9 percent, and similar soils with dark grayish brown granular surface, formed on basic igneous rock alluvium.

This soil is used for irrigated prunes, apricots, walnuts and dryland hay or pasture. There is enough gravel present in the surface soil to interfere slightly with tillage operations. Capability unit IIs4 (14) and IIIcl (15).

Garretson fine sandy loam, 0 to 2 percent slopes (GpA). This soil is nearly level, with an average slope less than 2 percent. Texture is a fine sandy loam. Subsoil and substratum is stratified and the texture may be fine sandy loam, gravelly loam or sandy loam; the sand and gravel strata is missing. This soil holds 8 to 9 inches of water plants can use. Favorable rooting depth is very deep. Otherwise, it is similar to Garretson loam, gravel substratum, 0 to 2 percent slopes. Included in mapping are areas of gravelly loam texture and similar soils with mottled subsoils.

This soil is used for irrigated prunes, apricots, walnuts, dryland hay and pasture. Capability unit I-1 (14).

This complex is used for dryland hay, pasture and range. Gaviota loam is Capability unit VIel (15) range site, Shallow Loamy; and Los Gatos gravelly loam is in Capability unit IVel (15), range site Loamy.

Gaviota-Los Gatos complex, 30 to 50 percent slopes (GmF). This complex consists of two soils which are intermixed and it was not feasible to map them separately. Gaviota soils are similar to Gaviota loam, 30 to 75 percent slopes and occupy the ridges and south slopes. Los Gatos soils are similar to Los Gatos gravelly loam, 50 to 75 percent slopes, and occupy the more moist areas on north slopes. This unit occurs on steep uplands under a grass and woodland cover.

The proportion of soils varies from area to area, but it is estimated that the soils occur in a ratio of 50 percent Gaviota loam and 35 percent Los Gatos gravelly loam. The other 15 percent is Los Osos clay loam and Vallecitos loam.

This complex is used for dryland pasture and range. Gaviota loam is Capability unit VIIel (15); range site Shallow Loamy, steep phase; Los Gatos gravelly loam is Capability unit VIel (15), range site Loamy, steep phase.

GILROY SERIES

The Gilroy series consists of well drained soils, having moderately fine textured subsoils, underlain by basic igneous bedrock at depths of 2 to 3 feet. The soils formed on moderately sloping to very steep uplands. Vegetation is grass and forbs, oak trees and brush. Elevations range from 500 to 2,000 feet. Mean annual rainfall is about 20 to 35 inches; mean annual air temperature is about 58 to 60° F. The growing season is about 200 to 250 days. Los Gatos, Maymen and Henneke are the principal associated soils.

Surface soil averages 6 to 10 inches in thickness, and is a brown, medium acid clay loam. Subsoil is a reddish brown, medium acid clay loam, averaging 12 to 16 inches in thickness. Substratum is brown, weathered basic igneous rock.

Gilroy soils are used for dryland vineyards, hayland, pasture and range. The very steep areas are used mostly for wildlife, recreation and watershed.

Gilroy clay loam, 30 to 50 percent slopes (GoF). This soil occurs on well rounded ridges and steep side slopes of 35 to 40 percent.

Representative profile: 4/10 of a mile east of the Castro Valley Ranch gate on a hillside northeast of the Castro Valley Road in N. E. 1/4 of the S. W. 1/4 Sec. 18, T. 11 s., R. 4 E., Santa Clara County, California.

A1 0 to 8 inches, brown (7.5YR 5/4) clay loam, contains about 5 percent gravels, dark brown (7.5YR 3/2) moist; moderate, medium and fine granular structure; hard, very friable, sticky and plastic; plentiful very fine roots; many very fine interstitial, common very fine tubular pores; medium acid (pH 6.0); clear wavy boundary. (6 to 10 inches thick).

B2t 8 to 21 inches, reddish brown (5YR 4/3) clay loam, contains about 5 percent gravels, dark reddish brown (5YR 3/2) moist; weak medium subangular blocky structure; hard, very friable, sticky and plastic; few very fine roots; many very fine interstitial; few fine and medium tubular pores; common thin clay films bridging mineral grains on ped faces and in pores; medium acid (pH 6.0); abrupt irregular boundary. (12 to 16 inches thick).

R 21 inches, brown metamorphosed basic igneous rock (greenstone) with moderately thick clay films on rock surfaces and also black manganese stains on mineral grains; variable as to hardness and composition over short distances.

Colors of the surface are typically brown, but may be dark brown, dark reddish brown or reddish brown. Texture is a clay loam, that usually contains 5 to 8 percent by volume of medium and fine gravel. Reaction is medium acid and usually changes little with depth. Subsoil color is typically reddish brown but may be brown or dark brown. Texture is clay loam or gravelly clay loam. In a few places, the subsoil is only a few inches thick or tongues into fracture planes of the bedrock. Soft to hard greenstone rock is at depths of 20 to 36 inches, but will average a little over 20 inches.

Included in mapping this soil are 10 percent Los Gatos gravelly loam, and small areas of clay texture.

This well drained soil has moderate fertility and average water holding capacity is 4 to 5 inches. Surface runoff is rapid. Erosion hazard is high. Subsoil permeability is moderately slow. Rooting depth is moderately deep.

This soil is used for dryland pasture and range. Capability unit VIe5 (15); pasture and range site Loamy, steep phase.

Gilroy clay loam, 5 to 30 percent slopes (GoD). This soil occupies moderately sloping to moderately steep uplands, having an average slope of about 20 percent. Runoff is medium, and erosion hazard is moderate. Otherwise, this soil is similar to Gilroy clay loam, 30 to 50 percent slopes. Included in mapping are Los Gatos gravelly loam 10 percent, and areas of rock outcrop.

This soil is used for dryland pasture and range. Capability unit IVe5 (15); pasture and range site Loamy.

Gilroy clay loam, 15 to 30 percent slopes, eroded (GoE2). This soil occupies moderately steep uplands with about 20 percent average slope. Sheet erosion has removed an average of 2 to 3 inches of top soil. Depth to underlying bedrock averages a little over 20 inches. Average water holding capacity is 3 to 4 inches; runoff is medium and erosion hazard is moderate. Otherwise, this soil is similar to Gilroy clay loam, 30 to 50 percent slopes. Included in mapping are areas of severe rill and sheet erosion, 30 percent of the acreage. In a few areas, the substratum where soft enough, has mixed with the surface and subsoils by tillage implements. Small areas of shallow soil are also included.

Most of this soil has been planted to grapes, or used for dry-farmed grain hay. Capability unit IVe5 (15); pasture and range site Loamy.

Gilroy clay loam, 50 to 75 percent slopes (GoG). This soil occupies very steep uplands averaging 55 percent slopes. Surface soil may be dark brown or dark reddish brown on the north slopes. In areas of concave slopes, the soil may be 40 to 50 inches deep to weathered bedrock. Runoff is very rapid and erosion hazard is very high. Otherwise, this soil is similar to Gilroy clay loam, 30 to 50 percent slopes. Included in mapping are areas of Los Gatos gravelly loam 10 percent; 5 percent Maymen rocky loam and areas of rock outcrop.

This soil is used for limited range, wildlife, recreation and watershed. Capability unit VIIe5 (15); pasture and range site Loamy, very steep phase.

HENNEKE SERIES

The Henneke series consists of somewhat excessively drained, rocky soils that have fine textured, very gravelly subsoils, underlain by serpentine bedrock at depths of 10 to 18 inches. They formed on steep to very steep uplands. Vegetation is brush and some digger pines. Elevations range from 1,600 to 2,500 feet. Mean annual rainfall is 16 to 20 inches; mean annual air temperature is about 58 to 60°. The average growing season is about 200 to 250 days. Vallecitos, Gaviota and Los Gatos are the principal associated soils.

The surface soil averages 1 to 4 inches in thickness and is a reddish brown neutral, gravelly clay loam. The subsoil is dark reddish brown, neutral, very gravelly clay averaging 10 to 14 inches in thickness. The substratum is serpentine bedrock. There is usually 2 to 10 percent rock outcrop.

Henneke soils are used mainly for watershed, recreation and wildlife. Some of the parent rock material is used as a source of magnesite.

This land type is used for wildlife and recreation. A few areas are used by the city and county for dumping trash and other materials. Capability unit VIIIw4 (14).

PLEASANTON SERIES

The Pleasanton series consists of well drained soils, having moderately fine textured subsoils, underlain by old gravelly sedimentary alluvium. These soils formed on nearly level to moderately steep fans and terraces. Vegetation is chiefly annual grasses and forbs with scattered oak trees. Elevations range from 200 to 1,000 feet. Mean annual rainfall is 16 to 20 inches; mean annual air temperature is 58 to 60° F. The growing season is about 260 to 300 days. Hillgate and Arbuckle are the principal associated soils.

The surface soil averages 12 to 20 inches in thickness and is a grayish brown, slightly acid loam or gravelly loam. Subsoil is dark grayish brown and neutral gravelly clay loam, ranging from 24 to 30 inches in thickness. The substratum is neutral, yellowish brown, sandy clay loam over gravelly alluvial material extending to an undetermined depth.

Pleasanton soils are used for irrigated row crops, orchards, vineyards and dryland hay, pasture and range. They are also used for housing and commercial developments.

Pleasanton loam, 0 to 2 percent slopes (PoA). This soil occurs on nearly level old fans.

Representative profile: About 10 feet off north side of road on Dryden Avenue, 700 feet east of New Avenue; Santa Clara County, California.

Ap 0 to 5 inches, grayish brown (10YR 5/2) loam, very dark grayish brown (10YR 3/2) moist; massive; hard, friable, slightly sticky and slightly plastic; few very fine roots; many very fine interstitial and common very fine tubular pores; slightly acid (pH 6.5); abrupt smooth boundary. (0 to 6 inches thick).

A12 5 to 18 inches, grayish brown (10YR 5/2) loam, very dark grayish brown (10YR 3/2) moist; massive; hard, friable, slightly sticky and slightly plastic; few very fine and medium roots; many very fine interstitial, common fine tubular and a few medium tubular pores; slightly acid (pH 6.5); clear wavy boundary. (12 to 14 inches).

B1t 18 to 23 inches, dark grayish brown (10YR 4/2) clay loam, very dark grayish brown (10YR 3/2) moist; massive; hard, friable, slightly sticky and slightly plastic; few medium roots; many very fine interstitial and tubular pores; common thin clay films lining pores and on ped faces;

neutral (pH 7.0); clear smooth boundary. (4 to 6 inches thick).

B2t 23 to 44 inches, brown (10YR 5/3) gravelly heavy clay loam, dark brown (10YR 3/3) moist; moderate medium subangular blocky structure; very hard, friable, sticky and plastic; few very fine roots; many very fine and fine, few medium tubular pores; many moderately thick clay films on ped faces and lining pores; neutral (pH 7.0); clear smooth boundary. (20 to 24 inches thick).

B3t 44 to 66 inches, yellowish brown (10YR 5/4) gravelly sandy clay loam, dark yellowish brown (10YR 4/4) moist; massive; hard, friable, sticky and plastic; few medium roots; many very fine, fine interstitial and tubular, also a few medium tubular pores; common thin clay films in pores and on ped faces; neutral (pH 7.0).

The surface soil color is brown or grayish brown and occasionally dark grayish brown. Texture is typically loam but will range to a light clay loam with some medium and fine gravel, ranging from 3 to 5 percent by volume. Reaction is slightly acid to neutral and changes little with depth. Subsoil color is brown, dark grayish brown or yellowish brown. Texture is a gravelly clay loam or gravelly sandy clay loam. The substratum is lighter colored and more yellowish than the subsoil. Lime is occasionally present in the substratum.

Included in mapping this soil are 5 percent areas of San Ysidro loam; 5 percent Hillgate silt loam; and a few areas of soils similar to Pleasanton loam that have medium acid subsoils, 5 percent. The included soils are only moderately deep to a clay subsoil which may cause irrigation management problems.

This well drained soil is moderately fertile, and average water holding capacity is about 8 to 9 inches. Subsoil permeability is moderately slow. Surface runoff is very slow and erosion is not a problem. Favorable rooting depth is very deep but is somewhat restricted by the moderately fine textured subsoil.

This soil is used for irrigated row crops, apricots, prunes, walnuts, grapes, dryland grain hay and pasture. Large areas are also used for housing and commercial developments. Capability unit I-3 (14).

Pleasanton loam, 2 to 9 percent slopes (PoC). This soil occurs as small to moderately sized areas on slightly older alluvial fans. Average slope ranges from 3 to 5 percent. Runoff is slow to medium and erosion hazard is slight to moderate. Otherwise, this soil is similar to Pleasanton loam, 0 to 2 percent slopes. Included in mapping are areas of moderate sheet erosion.

This soil is used for irrigated prunes, apricots, grapes, walnuts, dryland hay and pasture. Large areas of this soil are also used for housing and commercial development. Capability unit IIe1 (14).

Pleasanton gravelly loam, 0 to 2 percent slopes (PpA). Except for being a gravelly loam on the surface, this soil is similar to Pleasanton loam, 0 to 2 percent slopes. The average percent of gravel ranges from 15 to 20 percent by volume. It holds about 5 to 7 inches of water plants can use. Included in mapping are areas of Cropley clay 10 percent; and 5 percent San Ysidro loam.

This soil is used for irrigated apricots, prunes, walnuts, grapes, dryland hay and pasture. It is also used for housing and commercial development. There is usually enough gravel on the surface to interfere slightly with tillage operations. Capability unit IIs4 (14).

Pleasanton gravelly loam, 2 to 9 percent slopes (PpC). This soil occurs as small to moderate sized areas at the upper part of the slightly older alluvial fans. Average slope is 3 to 5 percent. Texture is a gravelly loam on the surface; the gravel ranges from 15 to 25 percent by volume. Average water holding capacity is about 5 to 7 inches. Runoff is slow to medium and erosion hazard is slight to moderate. Otherwise, this soil is similar to Pleasanton loam, 0 to 2 percent slopes. Included in mapping, are small areas of Cropley clay 5 percent; 5 percent Hillgate silt loam, and 5 percent Yolo gravelly loam.

Except for areas in the small upland valleys, most of this soil is cultivated. It is used for irrigated prunes, apricots, grapes, dryland hay and pasture. There is generally enough gravel to interfere slightly with tillage operations. Capability unit IIIe4 (14).

Pleasanton gravelly loam, 9 to 15 percent slopes, eroded (PpD2). This soil occurs as small areas on strongly sloping terraces. Average slope is 12 percent. Texture is gravelly loam and the gravel ranges from 15 to 25 percent by volume. The average water holding capacity is about 5 to 7 inches. Runoff is medium, erosion hazard is moderate. Otherwise, this soil is similar to Pleasanton loam, 0 to 2 percent slopes. Included in mapping are small areas of 10 percent Hillgate silt loam; and areas of severe sheet erosion.

This soil is used for dryland hay, pasture and range. There is generally enough gravel to interfere slightly with tillage operations. Capability unit IVe1 (15); pasture and range site Loamy.

Pleasanton gravelly loam, 15 to 30 percent slopes, eroded (PpE2). This soil occurs as small areas on moderately steep terraces, facing toward deeply entrenched stream channels. The average slope is 20 percent. Texture is gravelly loam and the gravel ranges from 15 to 20 percent by volume. Average water holding capacity is about 5 to 7 inches. Runoff is rapid, and erosion hazard is high. Past sheet and gully erosion is moderate to severe. Otherwise, this soil is similar to Pleasanton loam, 0 to 2 percent slopes. Included in mapping are 10 percent areas of Positas loam; and 5 percent Saratoga loam.

This soil is used for dryland pasture and range. Capability unit VIe1 (15); pasture and range site Loamy.

POSITAS SERIES

The Positas series consists of well drained soils, having claypan like subsoils, underlain by old mixed alluvium. They formed on strongly sloping to moderately steep terraces. Vegetation is grasses, forbs and scattered oak trees. Elevations range from 200 to 2,000 feet. Mean annual rainfall is 16 to 20 inches; mean annual air temperature is 58 to 60° F. The growing season is 250 to 300 days. Pleasanton, San Ysidro and Azule are the principal associated soils.

The surface soil ranges from 10 to 25 inches in thickness and is a brown, medium acid loam. The subsoil is a reddish brown, medium acid clay ranging from 14 to 20 inches thick in the upper part, and yellowish brown, slightly acid clay loam, 8 to 15 inches thick in the lower part.

Positas soils are used for irrigated apricots, prunes, grapes, dryland hay and pasture. Some areas are used for housing and commercial developments.

Positas-Saratoga loams, 9 to 15 percent slopes (PrD). This complex consists of soils which are intermixed and it was not feasible to map them separately. They occur on strongly sloping terraces with an average slope of 12 percent.

A representative profile of Positas loam follows, and the profile for Saratoga loam is described under the respective series.

Representative Positas profile: 50 yards east of Almaden road, 1/2 mile south of McKean Road; Santa Clara County, California.

AP 0 to 7 inches, brown (10YR 5/3) loam, dark brown (7.5YR 3/2) moist; massive; hard, friable, nonsticky and nonplastic; few fine roots; many very fine tubular pores; medium acid (pH 6.0); clear smooth boundary. (5 to 8 inches thick).

A12 7 to 16 inches, brown (10YR 5/3) loam, dark brown (7.5YR 3/2) moist; massive; hard, friable, nonsticky and nonplastic; few fine roots; many very fine tubular pores; medium acid (pH 6.0); abrupt smooth boundary. (5 to 17 inches thick).

Otherwise, this soil is similar to Yolo loam, 0 to 2 percent slopes. Included in mapping are 10 percent areas of Garretson gravelly loam; and 5 percent Pleasanton gravelly loam.

This soil is used for irrigated row crops, sugar beets, prunes, apricots, walnuts, pears, grapes and dryland pasture. About 30 percent of this soil is used for housing and commercial developments. Capability unit IIe5 (14).

ZAMORA SERIES

The Zamora series consists of well drained soils having moderately fine textured subsoils, underlain by alluvium of mixed origin. They are formed on nearly level to moderately sloping alluvial fans. Vegetation is chiefly annual grasses and forbs, with scattered oak trees. Elevations range from 200 to 1,000 feet. Mean annual rainfall is 16 to 20 inches; mean annual air temperature is 58 to 60° F. and the growing season is about 250 to 300 days. Pleasanton and Yolo are the principal associated soils.

The surface soil averages 12 to 20 inches in thickness and is a dark grayish brown, neutral loam or clay loam. The subsoil is a dark brown or brown, neutral clay loam, ranging from 20 to 30 inches in thickness. The substratum is stratified, gravelly, sandy clay loam and fine sandy clay loam alluvium.

Zamora soils are used for irrigated row crops, orchards, vineyards, dryland hay and pasture. A few areas are used for housing and commercial developments.

Zamora clay loam, 0 to 2 percent slopes (ZbA). This soil occurs as nearly level fans in the Paradise Valley area and as smaller bodies throughout the survey area. Average slope is less than 2 percent.

Representative profile: In a prune orchard just about 30 feet southwest of the intersection of Bowden Avenue and Watsonville Road; Santa Clara County, California.

Ap 0 to 7 inches, dark grayish brown (10YR 4/2) clay loam, very dark grayish brown (10YR 3/2) moist; cloddy; hard, friable, sticky and plastic; few very fine roots; many very fine interstitial pores; neutral (pH 7.0); abrupt smooth boundary. (6 to 8 inches thick).

A12 7 to 15 inches, dark grayish brown (10YR 4/2) clay loam, very dark grayish brown (10YR 3/2) moist; massive; friable, sticky and plastic; few very fine and medium roots; neutral (pH 7.0); clear smooth boundary. (6 to 12 inches thick).

B21t 15 to 26 inches, dark brown (10YR 4/3) clay loam, dark brown (10YR 3/3) moist; moderate, medium subangular blocky structure; hard, friable, sticky and plastic; few very fine and medium roots; many very fine interstitial and tubular pores, a few medium tubular pores; continuous thick clay films lining pores and on ped faces; neutral (pH 7.0); clear wavy boundary. (11 to 14 inches thick).

B22t 26 to 35 inches, brown (10YR 5/3) clay loam, dark brown (10YR 4/3) moist; with a few fine faint mottles yellowish brown (10YR 5/4) dry and dark yellowish brown (10YR 4/4) moist; moderate medium subangular blocky structure; hard, friable, sticky and plastic; many very fine interstitial and tubular pores; also a few medium tubular pores; many thin clay films line pores and on ped faces; neutral (pH 7.0); clear smooth boundary. (9 to 16 inches thick).

C1 35 to 58 inches, brown (10YR 5/3) fine sandy clay loam, dark brown (10YR 4/3) moist; massive; slightly hard, very friable, sticky and plastic; many very fine interstitial and tubular pores; neutral (pH 7.0); clear smooth boundary. (20 to 30 inches thick).

C2 58 to 70 inches, pale brown (10YR 6/3) gravelly sandy clay loam, about 30 percent gravel, brown (10YR 5/3) moist; massive; slightly hard, very friable, nonsticky and nonplastic; many fine and very fine interstitial pores; neutral (pH 7.0).

Color of the surface soil is typically dark grayish brown. A few places may be grayish brown or dark brown. Reaction is neutral to slightly acid and changes little with depth from the surface to the substratum. Texture is a clay loam or silty clay loam. Color of the subsoil is dark brown or brown. Texture is a clay loam or gravelly clay loam. There is a slight clay increase from the surface to the subsoil. The substratum is lighter colored and more yellowish than the subsoil.

Included in mapping this soil are 10 percent areas of Pleasanton loam, occurring on the extending stringers of old fans; and, along drainageways, 5 percent small bodies of Yolo loam.

This well drained soil has a water holding capacity of about 10 to 11 inches. Fertility is high. Surface runoff is very slow and erosion is not a problem. Subsoil permeability is moderately slow. Favorable rooting depth is very deep.

This soil is used for irrigated row crops, prunes, apricots, walnuts, grapes, and dryland hay and pasture. Capability unit I-1 (14).

Zamora clay loam, 2 to 9 percent slopes (ZbC). This soil occurs as small to moderately sized areas on gently to moderately sloping fans. Average slope ranges from 3 to 5 percent. Texture is a silty clay loam,clay loam or gravelly clay loam. This soil holds 9 to 10 inches of water plants can use. Runoff is slow to medium.

Erosion hazard is slight to moderate. Otherwise, this soil is similar to Zamora clay loam, 0 to 2 percent slopes. Included in mapping are areas of gravelly clay loam and gravelly loam texture.

This soil is used for irrigated row crops, prunes, apricots, walnuts, grapes and dryland pasture and hay; some housing and commercial developments. Capability unit IIe5 (14).

Zamora loam, 0 to 2 percent slopes (ZaA). This soil occurs on small nearly level fans throughout the survey area. The average slope is less than 2 percent. Color of the surface soil is grayish brown and the texture is a loam or light clay loam, and about 3 to 6 percent by volume of medium and fine gravel. It holds about 9 to 10 inches of water plants can use. Otherwise, this soil is similar to Zamora clay loam, 0 to 2 percent slopes. Included in mapping are 10 percent areas of Pleasanton loam; and 5 percent Yolo loam.

This soil is used for irrigated row crops, apricots, prunes, walnuts, grapes and dryland hay and pasture. A few acres are used for housing and commercial uses. Capability unit I-1 (14).

Zamora loam, 2 to 9 percent slopes (ZaC). This soil occupies gently to moderately sloping areas, with 3 to 6 percent average slopes. Surface soil color is grayish brown. Texture is a loam or light clay loam; with about 3 to 8 percent by volume of medium and fine gravel. Runoff is slow to medium and erosion hazard is slight to moderate. Otherwise, this soil is similar to Zamora clay loam, 0 to 2 percent slopes. Included in mapping are areas of 10 percent Hillgate silt loam; and 5 percent Pleasanton loam.

This soil is used for irrigated row crops, apricots, prunes, walnuts, grapes, and dryland hay and pasture. Capability unit IIel (14).

Zamora and Cropley soils, 2 to 9 percent slopes, severely eroded (ZeC3). These undifferentiated soils occur on gently to moderately sloping fans and toe slopes. Slopes are mostly short and toward deeply cut channels. Zamora clay loam and Cropley clay have been damaged by severe gully and sheet erosion. Included in mapping these soils are areas of 15 percent Azule clay loam; 5 percent Los Osos clay loam; and 5 percent Diablo clay.

These undifferentiated soils are used for dryland pasture and range. Because of uneven surfaces, gullies and deposition, it is not practical to cultivate these soils. Capability unit IVe5 (15); pasture and range for Zamora is Fine Loamy and pasture and range site for Cropley is Clayey.

Jeff Rodrig / SCS

Hydric Soils in Santa Clara Area

Map Symbol	Soil Name	Hydric Component	Location Notes
AcF	Altamont clay, 30 to 50 percent slopes		
AcE	Altamont clay, 15 to 30 percent slopes		
AcE2	Altamont clay, 15 to 30 percent slopes, eroded		
AcG2	Altamont clay, 50 to 75 percent slopes, eroded		
An	Alviso clay	Alviso (CA0141)	
ArA	Arbuckle gravelly loam, 0 t0 2 percent slopes		
AkC	Arbuckle loam, deep, 5 to 9 percent slopes		
AsE	Ayar clay, 15 to 30 percent slopes		
AsD	Ayar clay, 9 to 15 percent slopes		
AsF	Ayar clay, 30 to 50 percent slopes		
AuG	Azule clay loam, 30 to 75 percent slopes		
AuG2	Azule clay loam, 30 to 75 percent slopes, eroded		

Hydric Soils in Santa Clara Area

Map Symbol	Soil Name	Hydric Component	Location Notes
AvD2	Azule silty clay loam, 9 to 15 percent slopes, eroded		
AvE	Azule silty clay loam, 15 to 30 percent slopes		
AvE2	Azule silty clay loam, 15 to 30 percent slopes, eroded		
Ba	Bayshore clay loam	Bayshore (CA1337)	
BeG	Ben Lomond fine sandy loam, 50 to 75 percent slopes		
Ca	Campbell silty loam	Clear Lake (CA0013)	low alluvial plains
Cd	Campbell silty clay	Clear Lake (CA0013)	low alluvial plains
Cc	Campbell silty clay loam, clay substratum	Cambell (CA1356)	
Ce	Cambell silty clay, muck substratum	Cambell (CA1356)	
Cf	Castro clay		
Ch	Clear Lake clay drained	Cambell (CA1356) Sunnyvale (CA1381)	low bottoms alluvial plains
Cg	Clear Lake clay	Clear Lake (CA0013)	
Ck	Clear Lake clay saline	Clear Lake (CA1522)	

Hydric Soils in Santa Clara Area

Map Symbol	Soil Name	Hydric Component	Location Notes
CmE	Climara stony clay, 15 to 50 percent slopes		
CnD	Climara clay, 9 to 30 percent slopes		
CoB	Cortina very gravelly loam, 0 to 5 percent slopes	River wash	drainage ways
CrA	Cropley clay, 0 to 2 percent slopes	Clear Lake (CA0013)	Depressions
CrC	Cropley clay, 2 to 9 percent slopes		
CsA	Cropley clay loam 0 to 2 percent slopes	Cambell (CA1356)	
DaD	Diablo clay, 9 to 15 percent slopes		
DaE	Diablo clay, 15 to 30 percent slopes		
DaE2	Diablo clay, 15 to 30 percent eroded		
DaF	Diablo clay, 30 to 50 percent slopes		
EsA	Esparto loam, 0 to 2 percent slopes		
EsC	Esparto loam, 2 to 9 percent slopes		

Hydric Soils in Santa Clara Area

Map Symbol	Soil Name	Hydric Component	Location Notes
FaG	Felton silt loam, 50 to 75 percent slopes		
FaE	Felton silt loam, 15 to 30 percent slopes		
FaF	Felton silt loam, 30 to 50 percent slopes		
FbG	Felton-Ben Lomond complex, 50 to 75 percent slopes		
GaA	Garretson loam, gravel substratum 0 to 2 percent slopes		
GbB	Garretson gravelly loam, 0 to 5 percent slopes		
GpA	Garretson fine sany loam, 0 to 2 percent slopes		
GcG	Gaviota loam, 30 to 75 percent slopes		
GcD2	Gaviota loam, 5 to 15 percent slopes, eroded		
GcE	Gaviota loam, 15 to 30 percent slopes		
GkE2	Gaviota rocky loam 5 to 30 percent slopes, eroded		

Hydric Soils in Santa Clara Area

Map Symbol	Soil Name	Hydric Component	Location Notes
GhG2	Gaviota gravelly loam, 30 to 75 percent slopes, eroded		
GhG3	Gaviota gravelly 30 to 75 percent slopes, serverly eroded		
GmE	Gaviota-Los Gates complex, 15 to 30 percent slopes		
GmF	Gaviota-Los Gates complex, 30 to 50 percent slopes		
GoF	Gilroy clay loam, 30 to 50 percent slopes		
GoD	Gilroy clay loam, 5 to 30 percent slopes		
GoE2	Gilroy clay loam, 15 to 30 percent slopes, eroded		
GoG	Gilroy clay loam, 50 to 75 percent slopes		
HeG3	Henneke rocky clay loam, 30 to 75 percent slopes, severely eroded		
HfD2	Hillgate silt loam, 9 to 15 percent slopes, eroded		

Hydric Soils in Santa Clara Area

Map Symbol	Soil Name	Hydric Component	Location Notes
HfC	Hillgate silt loam, 2 to 9 percent slopes		
HfE2	Hillgate silt loam, 15 to 30 percent slopes, eroded		
HfF2	Hillgate stilt loam, 30 to 50 percent slopes, eroded		
InG2	Inks rocky clay loam, 50 to 75 percent slopes, eroded		
IsG3	Inks stony clay loam, 30 to 75 percent slopes, severly eroded		
KeC2	Keefers clay loam 2 to 9 percent slopes, eroded	Un-named soils	seep and marsh areas
KeA	Keefers clay loam, 0 to 2 percent slopes	Un-named soils	seep and marsh areas
KfB	Kitchen middens		
LaF	Lanslides		
LfG	Los Gatos gravelly loam, 50 to 75 percent slopes		
LfE2	Los Gatos gravelly loam, 15 to 30 percent slopes, eroded		

Hydric Soils in Santa Clara Area

Map Symbol	Soil Name	Hydric Component	Location Notes
LfF	Los Gatos gravelly loam, 30 to 50 percent slopes		
LgE	Los Gatos clay loam, 15 to 30 percent slopes		
LgE2	Los Gatos clay loam, 15 to 30 percent slopes, eroded		
LhG	Los Gatos-Gaviota complex, 50 to 75 percent slopes		
LkG3	Los Gatos and Maymen soils, 50 to 75 percent slopes, severely eroded		
LoE	Los Osos clay loam, 15 to 30 percent slopes		
LoF	Los Osos clay loam 30 to 50 percent slopes		
LoG	Los Osos clay loam, 50 to 75 percent slopes		
LrA	Los Robles clay loam, 0 to 2 percent slopes		
LrC	Los Robles clay loam, 2 to 9 percent slopes		
LtD	Los Trancos stony clay, 15 to 30 percent slopes		

Hydric Soils in Santa Clara Area

Map Symbol	Soil Name	Hydric Component	Location Notes
Ma	Made land		
MbF	Madonna loam, 30 to 50 percent slopes		
MbE	Madonna loam, 15 to 30 percent slopes		
MbE2	Madonna loam, 5 to 30 percent slopes, eroded		
MbG	Madonna loam, 50 to 75 percent slopes		
McB	Maxwell clay, 0 to 5 percent slopes		
MfG2	Maymen rocky fine sandy loam, 50 to 75 percent slopes, eroded		
MeF2	Maymen fine sandy loam, 15 to 50 percent slopes, eroded		
Mg	Mocho loam		
Mh	Mocho clay loam		
Mk	Mocho soils, undifferentiated		
MwF2	Montara rocky clay loam, 15 to 50 percent slopes, eroded		
MxF3	Montara stony clay loam, 30 to 50 percent slopes, severely eroded		

Hydric Soils in Santa Clara Area

Map Symbol	Soil Name	Hydric Component	Location Notes
MyE	Montara-Climara complex, 15 to 30 percent slopes		
Og	Orestimba silty clay loam	Orestimba	
Of	Orestimba clay loam	Orestimba	
Pd	Pacheco clay loam	Clear Lake (CA0013)	low alluvial plains
Pa	Pacheco fine sandy loam	Clear Lake (CA0013)	low alluvial plains
Pb	Pacheco silt loam, drained		
Pe	Pacheco clay loam, gravelly substratum	Pacheco (CA0048)	
Pf	Pacheco loams, clay substratum	Pacheco	small areas with high water tables
PgE	Parrish gravelly clay loam, 9 to 30 percent slopes		
PgF	Parrish gravelly clay loam, 30 to 50 percent slopes		
PgG	Parrish gravelly clay loam, 50 to 75 percent slopes		
Pg3	Permanente stony loam, 50 75 percent slopes, severely eroded		

Hydric Soils in Santa Clara Area

Map Symbol	Soil Name	Hydric Component	Location Notes
PkG	Pits		
PoA	Pleasanton loam, 0 to 2 percent slopes		
PoC	Pleasanton loam, 2 to 9 percent slopes		
PpA	Pleasanton gravelly loam, 0 to 2 percent slopes		
PpC	Pleasanton gravelly loam, 2 to 9 percent slopes		
PpD2	Pleasanton gravelly loam, 9 to 15 percent slopes, eroded		
PpE2	Pleasanton gravelly loam, 15 to 30 percent slopes, eroded		
PrD	Positas-Saratoga loams, 9 to 15 percent slopes		
PrC	Positas-Saratoga loams, 2 to 9 percent slopes		
RaA	Rincon clay loam, 0 to 2 percent slopes		

Hydric Soils in Santa Clara Area

Map Symbol	Soil Name	Hydric Component	Location Notes
Rg	Riverwash	Riverwash	
RnG	Rock land		
SaG2	San Andreas fine sandy loam, 30 to 75 percent slopes, eroded		
SaE2	San Andreas fine sandy loam, 15 to 30 percent slopes, eroded		
SbG	San Benito clay loam, 50 to 75 percent slopes		
SbE2	San Benito clay loam, 15 to 30 percent slopes, eroded		
SbF	San Benito clay loam, 30 to 50 percent slopes		
SbF3	San Benito clay loam, 30 to 50 percent slopes, severely eroded		
ScG	Santa Lucia shaly loam, 50 to 75 percent slopes		
ScF2	Santa Lucia shaly loam, 30 to 50 percent slopes, eroded		
SdA	San Ysidro loam, 0 to 2 percent slopes	San Ysidro	areas subjected to ponding
SdB2	San Ysidro loam, 2 to 9 percent slopes, eroded		

Hydric Soils in Santa Clara Area

Map Symbol	Soil Name	Hydric Component	Location Notes
SdD	San Ysidro loam, 9 to 15 percent slopes		
SeA	San Ysidro clay, overwash, 0 to 2 percent slopes		
SfA	San Ysidro loam, acid variant, 0 to 2 percent slopes		
SfC	San Ysidro loam, acid variant, 2 to 9 percent slopes		
SgC	Saratoga-Positas loams, 2 to 9 percent slopes		
SgD	Saratoga-Positas loams, 9 to 15 percent slopes		
SgE	Saratoga-Positas loams, 15 to 30 percent slopes		
ShE2	Soper gravelly loam, 15 to 30 percent slopes, eroded		
ShF	Soper gravelly loam, 30 to 50 percent slopes		
Sv	Sunnyvale silty clay, drained	Clear Lake (CA0013)	low alluvial plains
Su	Sunnyvale silty clay	Sunnyvale (CA1381)	

Hydric Soils in Santa Clara Area

Map Symbol	Soil Name	Hydric Component	Location Notes
TeF	Terrace Escarpments		
Tf	Tidal marsh	Tidal Marsh	
VaE2	Vallecitos loam, 15 to 30 percent slopes, eroded		
Vaf	Vallecitos loam, 30 to 50 percent slopes		
VaG2	Vallecitos loam, 50 to 75 percent slopes, eroded		
Wa	Willows clay	Willows (CA0419)	
Wb	Willows clay, slightly alkali	Willows (CA0419)	
YaA	Yolo loam, 0 to 2 percent slopes		
YaB	Yolo loam, 2 to 5 percent slopes		
YeA	Yolo silty clay loam, 0 to 2 percent slopes		
YeC	Yolo silty clay loam, 2 to 9 percent slopes		
ZbA	Zamora clay loam, 0 to 2 percent slopes		
ZbC	Zamora clay loam, 2 to 9 percent slopes		
ZaA	Zamora loam, 0 to 2 percent slopes		

Hydric Soils in Santa Clara Area

Map Symbol	Soil Name	Hydric Component	Location Notes
ZaC	Zamora loam, 2 to 9 percent slopes		
ZeC3	Zamora and Cropley soils, 2 to 9 percent slopes, severely eroded		